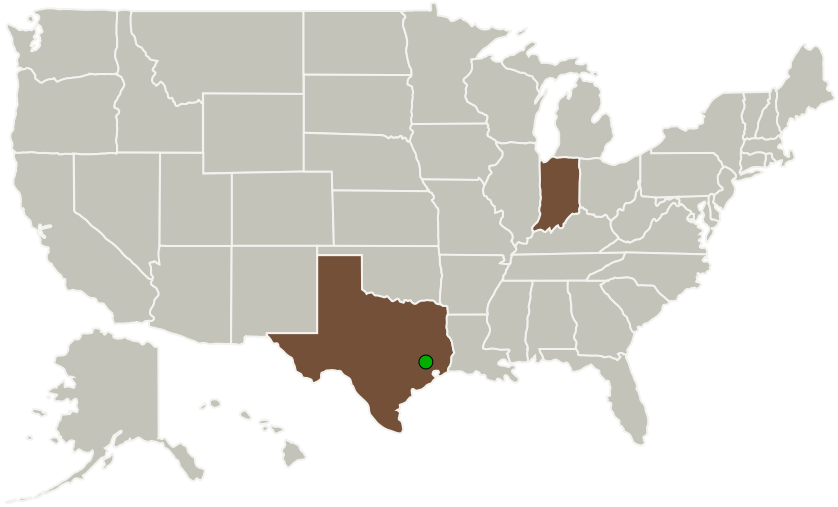
Microfluidic Multichannel Flow Cytometer, Phase II

Completed Technology Project (2010 - 2012)

Project Introduction

Techshot, Inc. proposes continued research and development of an on-orbit cell counter culminating in a deliverable hand-held blood cell counter in the form of a "Microfluidic Multichannel Flow Cytometer". Crew health monitoring, the Human Research Program and research in Fundamental Biology will all benefit from the availability of on-orbit cell counters that can provide immediate and repeated blood counts to assess potential anemia, neutropenia, neutrophila or possibility of infections, and signs of immune cell dysfunction. Three sequential objectives will be completed: (1) Subsystems consisting of a disposable microfluidics chip with multiple channels, fluorescence and light-scatter optics for cell detection, cell labeling protocols and reagents, electronics for controls and data processing and digital analysis and display hardware and software will be constructed and tested on the basis of Phase I research results. (2) Subsystems will be integrated into a benchtop flow cytometer for counting red and white blood cells and three subsets of white blood cells. (3) A compact hand-held cytometer device will be delivered to the sponsor. This handheld device can be operated by any on-board personnel and requires only a single drop of blood with fully automated processing of blood on-chip.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Techshot, Inc.	Lead Organization	Industry	Greenville, Indiana
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Indiana	Texas

Project Transitions

February 2010: Project Start

July 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139223)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Techshot, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

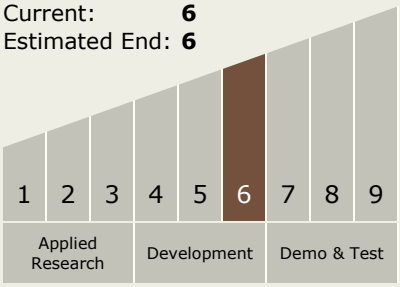
Carlos Torrez

Principal Investigator:

Paul Todd

Technology Maturity (TRL)

Start: **6**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System